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EXAMINER	
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2626	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/634,744	LEMOINE ET AL.
	Examiner	Art Unit
	Josiah Hernandez	2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 12/12/2007 have been fully considered but they are not persuasive.

The applicant argues that the references used do not teach doing a spectral analysis on imitated voice with out using predefined parameters. It is argued that the references also do not teach an acquisition step for both the model and imitation signal, the Spectral analysis step for both signals by dividing the signals into frequency bands, and finally the comparison step of comparing the bands and analyzing intensity levels.

However, Arslan et al. (US 6,615,174) teaches using codebooks for the coding of the source and target signals (column 5 lines 35-40). Although the codebooks are predefined parameters, it does not imply that the source or target signals are predefined and are constituted as a drawback. The use of the codebooks serves the purpose of using set coding parameters that describe in digital form the characteristics of a signal. The signal is broken down through spectral frequency analysis and then the characteristic parameters of the signal is extracted and mapped to a closes code book element in order to efficiently and quickly code a signal, of which has nothing to do with the signals being predefined before the imitation process takes place. Arslan teaches receiving both a source signal and a target signal and analyzing the signals in order to

extract the parameters to code (column 5 lines 35-40). Arslan also teaches performing a spectral analysis of which the signals are divided into samples (column 5 lines 60-67) so that the bandwidth of the formant frequencies may be analyzed (column 8 lines 60-67). Finally, the characteristic parameters (such as vocal tract characteristics and excitation characteristics, column 2 lines 59-63) from the formant frequencies of each band are compared in order to adjust the source signal so that it may sound like the target signal (column 7 lines 24-27).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 3, 6, 8 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Arslan et al. (US 6,615,174).

As to claim 1, Arslan discloses an audio-intonation calibration method (see abstract lines 2-3; column 2 lines 30-34, lines 41-42) in which an audio signal emitted by a subject is reproduced to the auditory organs of said subject after real time processing (see figure 1 # 117), which method is characterized in that it comprises the following steps: acquisition of a model audio signal to be imitated (see column 5 lines 35-40 and

lines 59-63; column 8 lines 35-40 and lines 46-50); spectral analysis of said model audio signal (see column 5 lines 35-40; column 6 lines 3-6; column 8 lines 35-40 and lines 46-60); acquisition of an imitation audio signal emitted by the subject (see figure 1 #119; figure 3 #300; column 5 lines 35-40 and lines 59-63); spectral analysis of the imitation audio signal (see figure 3 #302; column 2 lines 54-56; column 5 lines 35-40; column 6 lines 3-6); comparison of the spectra of the model audio signal and the imitation audio signal (see figure 3 #304, 306, and 308; column 2 lines 42-44 and lines 49-50; column 7 lines 17-29); correction of the imitation audio signal as function of the result of said comparison (see figure 5; column 2 lines 43-46; column 6 lines 54-56; column 8 lines 20-22); wherein at least the second spectral analysis step, the comparison step, and the correction step are carried out in real time and constitute the real time processing (line spectral frequencies can be estimated quite reliably and useful for real-time digital signal processing implementation, column 6 lines 5-10) and after the real time processing, reproduction to the auditory organs of the subject of the corrected audio signal (see figure 1 #119).

As to claim 2, Arslan discloses measurement of the dynamic range of the audio signal imitated by the subject (see column 8 lines 62-64; column 9 lines 5-9); measurement of the dynamic range of the corrected audio signal (see column 8 lines 62-64; column 9 lines 5-9); comparison of the dynamic range of the imitation audio signal and the corrected audio signal (see column 8 lines 62-64; column 9 lines 5-9); and correction of the dynamic range of the corrected audio signal as a function of the

fesult of said comparison before reproduction to the auditory organs of the subject of the corrected audio signal (see column 8 lines 62-64; column 9 lines 5-9).

As to claim 3, Arslan discloses an audio-intonation method characterized in that the comparison steps and correction steps are executed over a series of frequency bands in the range of audible frequencies (see column 8 lines 56-63; column 9 lines 26-38).

As to claim 6, Arslan discloses an audio-intonation method characterized in that the model audio signal to be imitated is a text and in that said method further includes a step of displaying said text (see figure 1 # 111).

As to claim 8, Arlsan discloses an audio-intonation calibration method (see abstract lines 2-3; column 2 lines 30-34, lines 41-42). Arlsan does not specifically teach the step of emitting said model audio signal to be imitated to the auditory organs of the subject before the step of acquiring the imitation audio signal emitted by the subject. It is inherent that in order for a subject to imitate a specific voice, accent, or singing method, it would be impossible to imitate it unless the subject can hear the speech signal before hand.

As to claim 13, Arslan discloses a fixed or removable information storage means, characterized in that said means contain softwar code portions adapted to execute the steps of an audio-intonation calibration method (see figure 1 # 106, 108, and 110; column 3 lines 45-57; column 4 lines 35-43).

As to claim 16, Arslan discloses the method according to claim 1, wherein during the correction step, each frequency band of the imitation audio signal is corrected so that an intensity value of the imitation audio signal in the respective band corresponds to an intensity value of the model audio signal in the respective band (the characteristic parameters, such as vocal tract characteristics and excitation characteristics, column 2 lines 59-63, from the formant frequencies of each band are compared in order to adjust the source signal so that it may sound like the target signal, column 7 lines 24-27).

As to claim 17, Arslan discloses the method according to claim 1, wherein the reproduction step includes reproducing the corrected imitation audio signal in headphones on auditory organs of the subject (figure 1, "S").

As to claim 18, Arslan discloses the method according to claim 1, wherein the first spectral analysis step includes dividing the model audio signal into a multiplicity of frequency bands and determining an intensity of the model audio signal in each of the frequency bands, wherein the second spectral analysis step includes dividing the imitation audio signal into same frequency bands as in the first spectral analysis step

and determining an intensity of the imitation audio signal in each of the frequency bands, wherein the comparison step includes, for each of the frequency bands, comparing the intensity of the model audio signal to the intensity of the imitation audio signal, and wherein the correction step includes correcting the imitation audio signal so that, for each of the frequency bands, an intensity of the corrected imitation audio signal corresponds to the intensity of the model audio signal (both a source signal and a target signal are received and analyzing the signals in order to extract the parameters to code, column 5 lines 35-40. Spectral analysis is performed of which the signals are divided into samples, column 5 lines 60-67, so that the bandwidth of the formant frequencies may be analyzed, column 8 lines 60-67. Finally, the characteristic parameters, such as vocal tract characteristics and excitation characteristics, column 2 lines 59-63, from the formant frequencies of each band are compared in order to adjust the source signal so that it may sound like the target signal, column 7 lines 24-27).

As to claim 19, Arslan discloses an audio-intonation calibration method (column 2 lines 30-34) in which an audio signal emitted by a subject is reproduced to auditory organs of the subject after real time processing (figure 1 #117), the method comprising the steps of: acquiring a model audio signal that is to be imitated be the subject (column 5 lines 35-40); performing a first spectral analysis of the model audio signal including dividing the model audio signal into a multiplicity of frequency bands and determining an intensity of the model audio signal in each of the frequency bands; emitting, by the subject, an imitation audio signal

that corresponds to the model audio signal; performing a second spectral analysis of the imitation audio signal including dividing the imitation audio signal into same frequency bands as in the first spectral analysis step and determining an intensity of the imitation audio signal in each of the frequency bands; comparing, for each of the frequency bands, the intensity of the model audio signal to the intensity of the imitation audio signal; correcting the imitation audio signal as a function of the result of the comparison step so that, for each of the frequency bands, an intensity of a corrected imitation audio signal corresponds to the intensity of the model audio signal, wherein at least the second spectral analysis step, the comparing step, and the correcting step are carried out in real time and constitute the real time processing; and after the real time processing, reproducing to the auditory organs of the subject the corrected imitation audio signal (both a source signal and a target signal are received and analyzing the signals in order to extract the parameters to code, column 5 lines 35-40. Spectral analysis is performed of which the signals are divided into samples, column 5 lines 60-67, so that the bandwidth of the formant frequencies may be analyzed, column 8 lines 60-67. Finally, the characteristic parameters, such as vocal tract characteristics and excitation characteristics, column 2 lines 59-63, from the formant frequencies of each band are compared in order to adjust the source signal so that it may sound like the target signal, column 7 lines 24-27).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arslan et al. (US 6,615,174).

As to claim 4, Arslan does not specifically disclose a method characterized in that the series of frequency bands corresponds to a subdivision of the range of audible frequencies. Part of the functionality of the proposed method would be to analyze the signals in a usable range within the audible frequency because not all the frequencies in the audible voice range would be useful for the proposed method. It would have been obvious for the analyzed signals in the method disclosed in Arslan to be a sub-range within the range of audio frequencies because there would only be a sub-range within the range of audible frequencies that would be pertinent to the method.

As to claim 5, Arslan does not specifically disclose a method characterized in that the range of audible frequencies is divided into at least 50 frequency bands. When a signal is being process in order to analyze it, the signal is usually

converted to the frequency domain then divided into numerous frequency bands so that an analysis can be done at different frequencies. It would have been obvious for the audio signals analyzed in Arslan to have been divided into more than 50 frequency bands because in order to make a successful analysis on a signal the frequencies would have to be divided into many frequency bands.

4. Claims 9, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arslan et al. (US 6,615,174) in view of Lee et al. ("A New Voice Transformation Method Based on Both Linear and Nonlinear Prediction Analysis", 3-6 October 1996).

As to claim 9, Arslan does not specifically disclose an audio-intonation method for practicing languages. Lee teaches using an audio-intonation calibration method characterized in that it further includes, before the emission step, a step of modifying the model audio signal to be imitated as a function of parameters representative of a language being studied (see introduction paragraph 1). It would have been obvious to practice speaking a language as disclosed in Lee with the audio-intonation calibration method in Arslan. Doing so would allow the user imitate an accent and the system would output the user's voice with the corrected accent allow for the user to improve on the accent (see introduction paragraph 1).

As to claim 11, Arslan does not specifically disclose an audio-intonation method for practicing languages. Lee teaches a method of practicing speaking a language being studied, in which method an audio signal emitted by a subject is reproduced to the auditory organs of the subject after real time processing, and which method is characterized in that it uses an audio-intonation calibration method (see introduction paragraph 1). It would have been obvious to practice speaking a language as disclosed in Lee with the audio-intonation calibration method in Arslan. Doing so would allow the user imitate an accent and the system would output the user's voice with the corrected accent allow for the user to improve on the accent (see introduction paragraph 1).

As to claim 14, Arslan discloses a fixed or removable information storage means, characterized in that said means contain softwar code portions adapted to execute the steps of an audio-intonation calibration method (see figure 1 # 106, 108, and 110; column 3 lines 45-57; column 4 lines 35-43). Arslan does not specifically disclose using storage medium for an audio-intonation method used for learning languages. Lee teaches a method of practicing speaking a language being studied, in which method an audio signal emitted by a subject is reproduced to the auditory organs of the subject after real time processing, and which method is characterized in that it uses an audio-intonation calibration method (see introduction paragraph 1). It would have been obvious to have used

the storage means in Arslan for the system that is used to improve speaking a language. Using the storage means will allow the system to properly accomplish its intended goals.

5. Claims 7, 10, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arslan et al. (US 6,615,174) in view of Gibson et al. (US 6,336,092).

As to claim 7, Arslan does not specifically disclose memorizing the spectral analysis of the model signal. Gibson teaches using an audio-intonation calibration method (see abstract) that memorizes that spectral analysis of the model audio signal to be imitated (see column 2 lines 23-27). It would have been obvious to have memorized the spectral analysis of the model signal as disclosed by Gibson in the audio-intonation calibration method in Arslan. Using such functionality, would allow the system to correct the imitated voice automatically or at a later moment.

As to claim 10, Arslan does not specifically disclose using the intonation method for singing a song. Gibson teaches using an audio-intonation calibration method characterized in that the model audio signal to be imitated is a song (see column 1 lines 9-11; column 2 lines 11-15) and in that said method further

includes, simultaneously with the step of reproducing the corrected audio signal to the auditory organs of the subject, a step of emitting an accompaniment signal of said son to the auditory organs of the subject (see column 6 lines 43-50). It would have been obvious to have used the intonation method in Arslan for the use of singing a song with an accompaniment as disclosed in Gibson because doing so would allow the singer to improve his voice by hearing how it should sound and the accompaniment would better assist that goal.

As to claim 12, Arslan does not specifically disclose using the intonation method for singing a son. Gibson teaches using a method of performance of a song by a subject, in which method an audio signal emitted by a subject is reproduced to the auditory organs of the subject after real time processing (see column 1 lines 9-11; column 2 lines 11-15). It would have been obvious to have used the intonation method in Arslan for the use of singing a song with an accompaniment as disclosed in Gibson because doing so would allow the singer to improve his voice by hearing how it should sound.

As to claim 15, Arslan discloses a fixed or removable information storage means, characterized in that said means contain softwar code portions adapted to execute the steps of an audio-intonation calibration method (see figure 1 # 106, 108, and 110; column 3 lines 45-57; column 4 lines 35-43). Arslan does not specifically disclose using storage medium for an audio-intonation system used

for singing a song. Gibson teaches a method of practicing singing a song, in which method an audio signal emitted by a subject is reproduced to the auditory organs of the subject after real time processing, and which method is characterized in that it uses an audio-intonation calibration method (see column 1 paragraphs 1, 2, and 3; column 2 paragraphs 2 and 3). It would have been obvious to have used the storage means in Arslan for the system that is used to practice singing a song. Using the storage means will allow the system to properly accomplish its intended goals.

Conclusion

A note has been made to notify the appropriate parties that the examiner has moved from Art Unit 2609 to 2626.

Any inquiry concerning this communication should be directed to Josiah Hernandez whose telephone number is 571-270-1646. The examiner can normally be reached from 7:30 pm to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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